**Accelerator Division EH&S Highlights**
**December 2002**

**Magnet Test Area Work Planning**
Representatives from the Industrial Safety (IS), Industrial Hygiene (IH), and Safety Systems (SSG) groups met with the Magnet Test Area system owner, Tommy Hiatt, to review work planning for upcoming activities. It is expected that workers will be working ~10 hrs. / day plus some Saturdays. The facility will be in operation ~18 hrs/day and the work mode will primarily be: measure – manipulate – measure. The work schedule will be vigorous and the work performed will be technically challenging. There are two very experienced workers assigned as well as one moderately experienced worker and one new worker. In addition, the facility will have a third test stand installed that uses a new high voltage power supply (700v/200amps). The EH&S staff recommended the system owner designate a dedicated area for the new power supply and test stand, and ensure that the new PS has adequate clearance per OSHA guidelines. Trip/fall control ideas included expanding walkways, re-routing cables, and installing simple railings or barricades. Lighting and other ergonomic improvements were also provided. The most notable recommendations involved the present interlock system. Specifically, the existing power supply interlocks rely too heavily on operator interaction. The SSG recommended the system owner either automate Supply/Magnet Under Test configuration switching (preferred), or attach the interlock cable to magnet cables, to reduce possibility of mixing up interlocks and magnet power. Twelve other suggestions were provided, most of which addressed interlock configuration, cabling, and management.

**ODH System**
Report on oxygen sensor electrolyte leak received from Analytical Industries. Manufacturer found pin hole leak in some units.

**Magenta Strobe Recent Failure**
Several magenta strobes have had to be repaired or replaced recently. Failures may be related to halo loss from G0 beam. A new style beacon has been purchased for future installations.

**GERT Database**
The long awaited automated training database update feature for GERT is now working. Completion of GERT Training results in a request for your user name and last 4 SSN. This is written to a file that is updated each evening in CIS and CANS.

**RadCon CARM EPROM Upgrade**
During the Thanksgiving holiday, most of the CARM EPROMs were replaced with functional 30-second latching EPROMs, which should aid in troubleshooting in the case of unresolved apparent CARM PSS trips.

**Two New RadCon Policies**
Two JLab RadCon Policy statements were reviewed. One was a re-visit to a Lab Policy already in-place on the release of ion exchange resin media for regeneration; a cost saving measure since new resin is expensive. The revision removes references to 10CFR834 and adds a reference to a RadCon Analytical Lab. The ion exchange media in

use in the NL and SL Service Buildings contains slightly elevated levels of Be-7. The magnet cooling water ion exchange media also can contain very low levels of activated metal corrosion products. The resin concentrates the radioactive material and it is detectable. According to current JLab policy, this resin can be released to a vendor for reprocessing if it meets the requirements in the policy.

The second statement was a new policy that addresses very low levels of Be-7 and other radionuclides occasionally found in soil on the JLab site. Work area controls for contamination keep the loose radioactivity to a minimum and eliminate any worker concern for ingested or inhaled radionuclides. However, these controls are not always adequate for keeping radioactive material away from the surrounding environment if the work is located, for example, at the high power beam dump cooling buildings or the RadCon waste processing area. Handling hundreds of bags of radwaste, each with removable radioactivity less than the limit, can still result in the transfer of a small quantity of radioactive material to the nearby parking lot. If this collects in runoff, it may be detectable at the picoCurie / gram level. The RadCon Group regularly checks for radioactive material in the soil around radioactive waste and radioactive component storage sites and would like to have a graded approach when responding. The policy uses a recent ANSI standard and develops a graded approach to radioactivity in soil.

**Hall C Beamline Redesign**
The Hall C downstream target beamline redesign will be under vacuum, as opposed to the helium purged atmospheric line we are used to. The good news from a safety perspective is that less ozone will be generated in Hall C. The beamline is aluminum. The IH group provided a cleaning protocol for aluminum to the Hall C group.

**Buffered Chemical Polish**
The electropolish acid will no longer be shipped premixed but wil instead be mixed after arrival on site. The mixture is 10% HF and 90% sulfuric acid. This equates to adding about 6 x 4l bottles of hydrofluoric acid to each 55 gallon drum of sulfuric acid, a much easier task than blending buffered chemical polish ( a three acid mix). The acids were scheduled for arrival at Jlab by Thursday, December 5$^{th}$. This acid is provided by a new supplier, Ashland Chemical. It meets QA specifications at the megabit cleanroom level: ppb impurity levels as opposed to ppm currently supplied by present supplier, Puritan Chemical.

**New Safety Warden in B89**
Deb Bruhwel is the new Bldg. 89 Safety Warden. She replaces Dave Gelhaar.

**NARDA RF Monitors**
The Safety Systems Group found that the NARDA area RF monitor is sensitive to noise on the DC power lines. Specifically, the noise generated by the switching power supply that powers the unit in the field consistently caused the unit to trip. A linear supply has been installed in the 1MW test stand area to power the NARDA unit in an effort to mitigate the apparent design flaw.

## ODH Rating in the Halls

The experimental halls are undergoing a reassessment for oxygen deficiency hazards rating. Backup calculations from D. Kashy give 5 hours to reach 19.5% O2 for flow limited accident. However, D. Arenius feels time is not a factor in ODH assessment to sufficiently justify the rating change, but rather the driving factor is risk of fatality. Note also that all ODH assessments have to be reviewed and approved by the Accelerator Division Engineering Department Head. Dave has forwarded the calculations for this review.

## SNS PLC Design Review

SNS requested K. Mahoney and H. Robertson participate in a design review of their PLC software. The review set for January 24-25, 2003 at Oakridge, TN.

## RadCon Test Plan for Radiation Measurement

RadCon has a test plan in place for the CEBAF to measure radiation levels at street level above the inline dumps to measure the effectiveness of the integral (ground) shielding. This measurement has never been done for actual electron beam interaction. An additional benefit of the measurement will be to assess the effectiveness of the CARMs for preventing unnecessary radiation exposure.

## Dosimetry

Scott is planning to conduct a DOELAP (Department of Energy Laboratory Accreditation Program) dosimetry assessment at the Waste Isolation Pilot Plant (WIPP). Also the Site Office completed its review of RadCon's response to the DOELAP review and approved them. This correspondence has been forwarded to the DOELAP Performance Evaluation Program Administrator and is it is expected that they will accept the corrective actions.

## GERT-CANS Interface For Training Verification

In December, the RadCon Group discovered that CANS was not receiving complete training updates on individual RadCon training status from CIS. CANS doesn't read data directly from the CIS table as originally believed. Instead, CIS sends a data string to CANS that contains the applicable updates for the period, and CANS updates accordingly. This data string did not have a check to see whether the status of the course was pass or fail. The result: CANS mistakenly gives everyone who failed a GERT or RadWorker test access to the site anyway. Consequently, an employee (only one) who failed the RadWorker I Test, SAF801T, in August 2001 had site access through December 9, 2002. The employee's access was revoke and the individual is retesting. The Computer Center has corrected the programming problem. The issue was also referred to C. Ficklen for evaluation as a notable event.

## Environmental Monitoring

Groundwater monitoring results came in. There was nothing unusual to report. The 4th quarter is the quarter when all wells are monitored. "A-ring" wells (innermost) are monitored quarterly, "B-ring" (most halfway or so between the accelerator and property boundary) wells are monitored semiannually, and the "C-ring" (outermost) wells and the one upstream well are monitored annually.

**TIG Small-sized Gloves Now Available**
Employees raised a concern about not being able to have a safe grip when performing pipefitter duties. The reason for the concern was because the gloves are too bulky and only stocked in men's medium and large sizes at the Stockroom. The Safety Lab now has ladies small sized gloves. Eventually they will be available in the Stockroom.

**FEL Penetrations**
In August 2002, the FEL penetrations were plugged with carpet padding purchased from Lowe's. This was done to mitigate the potential helium hazard in the second floor gallery. However, the carpet padding increases the combustible loading in the penetrations and therefore must be replaced with a more appropriate material. The JLab Fire Protection Engineer with assistance from the Industrial Hygiene Group have identified a potential substitute which will be evaluated in January 2003.

**Tunnel Forklifts Have Seen Better Days**
The Clark forklift for tunnel use is back in operation after rebuilding the master cylinder for the braking system. However this is temporary. Clark is currently going out of business and may not offer a replacement part for this. We may have to excess this forklift for the lack of parts. The Atlet side loader for the tunnel requires a new battery; the 12-year-old batter currently in service isn't holding a charge. Replacement cost is $4,000.

**Ozone Controls in Tunnel No Longer Required**
Due to detectable ozone levels in the exit stairwells, MCC operators were required to have an IH group ozone survey when going to controlled or restricted access after beam operations are terminated. The high ozone levels were detectable in the exit stairs (1 ppm) during beam operations. The levels were attributed to beam loss and vacuum problems. These problems have been resolved. An ozone survey was performed in the exit stairs during beam operations the second week in December, and the requirement for a survey was lifted.

**Improper Methanol Disposal**
A basin of methanol ( ¾ gallon) was inadvertently poured down the drain in the Production Clean Room the second week of December. The basin was not labeled, and the employee assumed it was full of water. This issue underscores the importance of labeling **all** containers, even if the contents are water. The main safety issues associated with this event are:

- Storage of methanol in an open basin in the cleanroom which is an unacceptable fire hazard
- Unlabeled container that resulted in violation of our sewer discharge permit: no flammable solvents are permitted to be discharged.

**Hall B Stopper Switches Need Adjustment**

The "OUT" position switch for the Hall B stopper number 2, system A failed to make up when the stopper was extracted. This prevented the Hall B from going to "Beam Permit". The Safety Systems Group readjusted the switch and it tested OK. However, all of the B2 stopper switches will need to be readjusted during the February shutdown to get them back in the middle of the adjustment range.

## Environmental Monitoring

The RadCon Group is finishing the air monitor data analysis for the contamination studies and starting a review of air monitoring data for the 2002 NESHAP report. Plots related to the data analysis for the contamination studies may be found in the files:
http://www.jlab.org/accel/RadCon/opsgraphs/airmona_oct7_oct8.pdf
http://www.jlab.org/accel/RadCon/opsgraphs/airmona_oct8_oct16.pdf
http://www.jlab.org/accel/RadCon/opsgraphs/airmona_nov6_nov18.pdf

### Be7 in Tritium Monitoring & Disposal Unit Water (TMDU)

Build-up in We opened building 91 for first time since the last experiment. The general dose rate in building ~ 10 mR/hr. There is a High Radiation area around one holding tank up to 120 mR/hr (1.2R/hr on contact). Bill Rust is cycling valves in an attempt to redistribute resin in tanks due to what is evidently a "channeling" problem that is resulting in elevated Be7 concentrations being evident in TMDU water.

### EH&S Tracking System QA

As part of the EH&S T3 Group's QA of the EH&S tracking system, the group noted that many items entered in the "Finding" field are actually recommended solutions to findings. To ensure the accurate tracking of data, it is important that the integrity of the data fields is maintained. Any item noted for change/improvement that requires follow up to closure is a good candidate for tracking in the system. And any item tracked in the system has a component of 1) what was noted as needing improvement and 2) a recommendation on a method/process/step(s) for implementing the improvement. Tracking these items does not denote a negative event or outcome and shouldn't be interpreted as such. The EH&S tracking system is primarily a tool to assist in bringing EH&S things that need to be done to timely closure, both efficiently and effectively.

## FEL Fire Alarms

The FEL experienced 4 false fire alarms over the several weeks in November and December 2002. Two of these were due to faulty IR sensor heads and two were due to the VESDA detection. Original agreement during FEL commissioning was to disable the VESDA in the mornings and enable it in the evenings. Due to the fire protection engineering's staff absences away from the lab, the VESDA system was not disabled and alarmed twice during hot work activities. All IR sensor heads have been taken out of the detection system program until the heads can be replaced. Additionally, the VESDA has been disabled until the end of March 2003. This series of false alarms raises the question as to why the workers/supervisor are not verifying the status of the VESDA as part of the Fire Hazard Work Permit (FHWP) preparation. Item #4 of the FHWP asks: "Are there smoke or heat detectors in the vicinity that could be activated? Call Plant Engineering (x7400) for advice/assistance." To facilitate this step, the Fire Protection Engineer recommended that his cell phone number be noted on the FHWP. The FEL staff addressed the issue of FHWP preparation at a subsequent morning FEL meeting.

**Certified Hazardous Materials Manager (CHMM) Training**
Sandy Prior, CHMM (Master's Level) was one of four persons from the local area chosen to present a CHMM certification workshop during the first week of December. The workshop, sponsored by the Academy of Certified Hazardous Materials Managers, was offered at Christopher Newport University from December 2-6, 2002.

# Administration Division Notes for EH&S Committee

*For meeting of 1/3/2003*

## Facilities Management Projects with EH&S Implications

### *New Cooling Tower for Computer Center*

A single-purpose cooling tower was recently installed over the loading dock at CEBAF Center. Because there will be regular access for preventive maintenance and inspections, a handrail is being installed around the open side of the canopy roof.

### *Acid Neutralization System Building*

Addition to Building 31 to house an increased capacity acid neutralization system. A subcontract was awarded the week of 12/9. Fiberglass doors are scheduled for delivery mid-February. On-site work will start after delivery of the doors. (PM - Chandra) Est. Construction Completion 5/30/03

### *Modification to ARC Gas Shed*

Add a lockable door and provide separation for different gas bottles (i.e. oxygen & fuel gases). Design package has been forwarded to Procurement to obtain proposals. ECD: 3/30/03. (PM – Chandra)

### *Electrical Construction and Services Subcontract*

The multi-year subcontract was awarded to Harris Electric. As was done with the HVAC subcontractor for the chiller project, all EH&S training required for the new workers is being provided during one week prior to work start date (2/1/03).

### *Site Storm Drainage Study*

Conduct a whole site survey of existing conditions and make recommendations to upgrade the current drainage system and to account for future onsite development. The A/E submitted a preliminary plan with three retention ponds totaling about six acres. Presented the preliminary plan to the Infrastructure Committee in December and with the City on 1/7/03. Comments will be forwarded to the A/E the week of 1/13/03 for finalization of the plan. Changes to the schedule were due to delays meeting with the City. ECD: 2/15/03. (PM - Brand)

### *Repair Waveguide Penetration SL03*

A videotaped investigation of the penetration and an adjacent penetration was completed on 12/20/02. Developing the scope of repair. The plan is to repair the current leaking penetrations in 2/03. (PM - Chandra)

## ARC

All ARC university tenants' labs were inspected during the month of December. In ODU's case, JLab EH&S staff and their campus EH&S representatives conducted the inspections jointly. This approach seemed to be extremely useful to all parties, and it will likely by the pattern for future inspections.

.

## Risk Management

Insurance renewals are complete. We have new carriers for our major policies – of greatest interest: workers' compensation and auto. Overall, our premiums increased about 16%. While this is galling, especially given our excellent loss-control history, it pales in comparison with the market overall. "Good" risks experienced increases in the 30-45% range, while lower performing risks saw increases approaching 100%. The aftereffects of 9-11 are still rippling through the insurance industry and will for some time to come.

## EH&S Training

Lloyd Gordon, an instructor for a highly touted electrical safety course at LANL, accepted JLab's invitation to design a similar course for JLab. His original date to visit here for "reconnaissance" had to be postponed until January.

The target is to have a product ready for pre-shutdown training.

## Emergency Management

The Severe Weather Planning Team convened for the first time this season. There were several outcomes. One was to revise and re-distribute the contact list for those involved with planning and/or responding to severe weather. Another was to summarize the winter weather preparation and response process into flow diagrams.

Facilities Management has made extensive improvements to its snow-removal and de-icing procedures. Buildings and areas that have mission-essential operations and high occupancy get the highest priority. Ultimately, a color-coded site plan showing removal priorities will be web-accessible.

The emergency-action cards attached to telephones on site are being replaced with an updated version. The new cards are being placed in a protective sleeve, and this will be attached to the phone itself, not the cord. The sleeve is meant to be "permanent," while the card can be replaced when needed at a modest cost.

# EH&S Reporting Activities for December 2002

- As of December 31st, there have been **145** days without a lost-time injury. The Lab record is **455** consecutive days without a lost-time injury. There were no recordable injuries to JLab or contractor staff in December, November or October. **LET'S KEEP UP THE GOOD WORK!!!!**

- Carter Ficklen attended the DOE Quality/Safety Meeting co-sponsored by the Quality Assurance Working Group and the Quality & Safety Management Special Interest Group (QSMSIG) on December 3-5 in Las Vegas. The workshop focused on quality assurance issues, recent Price-Anderson enforcement activities, and proposed rulemaking. The QSMSIG is sponsored by the DOE Training Resources and Data Exchange.

- EH&S Reporting received notice on December 12 that a small quantity of methanol was accidentally poured down a drain leading to a neutralization tank in the Test Lab. Accelerator Division staff is preparing an event analysis.

- A Hampton Roads Sanitation District (HRSD) industrial waste manager and a DOE Site Office representative accompanied EH&S Reporting staff to observe the status of the new Electropolish cabinet in the Test Lab. This was an HRSD informational visit.

## External Reporting

- EH&S Reporting screened two accelerator site access events for DOE occurrence reporting (ORPS) in December. Both events had a related theme as they involved accelerator site access by persons without either current radiation safety training or an appropriately trained escort. The initial event involved discovery of a JLab staff member who made repeated accelerator site accesses with expired training. The second event was a single December 6th accelerator site access by an untrained person (not a JLab staff member). Neither event required ORPS reporting. However, both events are being further reviewed as radiation protection programmatic issues under the DOE 10 CFR 835 rulemaking of the Price-Anderson Amendments Act.
- A draft Final Report was prepared for the October Vertical Test Area lockout/tagout "near miss" occurrence. The draft report was circulated for management review by the Institute for SRF and the Operations Department.
- EH&S Reporting conducted a preliminary review of the DOE ORPS Re-engineering Team's recommendations that were reported at the December DOE Executive Safety Conference. The proposed ORPS reporting criteria would increase JLab reporting by approximately 50%.

- **Work Smart Standards (WSS) Set**

  - Proposed changes to the WSS Set are in various stages of review, including the proposed addition of a local terrorist response plan.
  - EH&S Reporting is working with the Policy and Manuals Group to ensure new or modified hazards or standards become addressed appropriately in the EH&S Manual.

- **National Environmental Policy Act (NEPA)**

  - CEBAF and FEL Upgrade Environmental Assessment (EA)

    - The DOE Site Office is finalizing the team charter.
    - Proposed Action/Project Information Checklists are being prepared. The initial draft checklists for the CHL Facility Expansion and the new Shipping and Receiving/Warehouse Building are available for line management input.

  - EH&S Reporting is working with other laboratory staff to address other NEPA items.

- The requirement for a subcontractor to have an Environmental Protection Plan was added to the Chiller Plant Expansion - Test Lab project. EH&S Reporting provided input on the original submittal and identified opportunities to have the subcontractor truly document a commitment to protect the environment.

# Physics Division
# EH&S Activities
# December
# 2002

**For the month** – Commissioning new experimental apparatus and experimental equipment readiness for beam to three experimental halls were major division priorities.

## Experimental Readiness and Work Control Documents

Reference Jefferson Lab EH&S Manual Chapter 3120 – Experimental Review, and Chapter 3320 - Temporary Work Permits.

One Experiment Readiness Certificate was given final approval. The certificate went to the Hall A run group for the E01-012 experiment, which uses a polarized $^{3}$He target.

## Inspections

Reference Jefferson Lab EH&S Manual Chapter 5100 - Internal Inspections.

Four scheduled formal inspections identified one new recordable action item, which was immediately corrected. The Director and the Area Safety Warden, Ed Folts, accompanied the division EH&S staff on one of the inspections of Experimental Hall A. The Office of Assessment, Environmental Engineer, Linda Even, accompanied the division EH&S staff on one of the inspections of Experimental Equipment Laboratory.